

**ABSTRACT**

In accordance with an embodiment of the present invention, a method is provided for defining the portion of one or more chemical compounds having binding affinity for a target receptor. One or more chemical compounds to be tested are identified and then one or more key component fragments of the compound(s) are identified (e.g., a compound that "generically" defines the surface conformation and surface charge density of the one or more chemical compounds is "designed") which may impart affinity for the target receptor. Analogs containing one or more of the key component fragments are then identified or synthesized, and the analogs are coupled to a carrier to construct an analog-carrier conjugate. The analogs contain one or more functional groups such as carboxyl, hydroxyl, keto, amino, nitro, or sulfhydryl to react with the carrier molecule. Next, the analog-carrier conjugate is utilized to generate a panel of monoclonal antibodies *in vivo* or *in vitro*, wherein the monoclonal antibodies are capable of defining the characteristics of the key component fragments. Next, the monoclonal antibodies are assayed to determine which are most specific for the key component fragments of the chemical compound(s) and which bind to the chemical compound(s). Competitive binding assays, or other assays are then preferably conducted to determine the ability of the monoclonal antibodies to discriminate between different chemical compounds.